

CLAIMS

1. A noise filter for removing noise flowing in a signal wire formed on a circuit board, wherein:

a pair of external electrodes that are connected to the signal wire are formed on an outside of an insulator, and on an inside of the insulator, a plurality of coils are connected in series which having both ends thereof electrically connected to the external electrodes respectively, and a capacitor is connected in parallel to at least one of the plurality of coils;

the coils are each formed by connecting a plurality of coil conductors, which are laminated through the insulator, in a spiral configuration through a via hole; and

the capacitor is formed by arranging a shield electrode and a capacitance-forming electrode so as to be opposed to each other through the insulator, the shield electrode being located between upstream and downstream coils and commonly electrically connected to both the upstream and downstream coils, the capacitance-forming electrode being electrically connected to one of the pair of external electrodes.

2. A noise filter for removing noise flowing in a signal wire formed on a circuit board, wherein:

a pair of external electrodes that are connected to the signal wire are formed on an outside of an insulator, and on an inside of the insulator, a plurality of coils are connected in series which having both ends thereof electrically connected to the external electrodes respectively, and a capacitor is connected in parallel to at least

one of the plurality of coils;

the coils are each formed by connecting a plurality of coil conductors, which are laminated through the insulator, in a spiral configuration through a via hole; and

the capacitor is formed by arranging the coil conductors and a capacitance-forming electrode so as to be opposed to each other through the insulator, the capacitance-forming electrode being electrically connected to one of the pair of external electrodes.

3. The noise filter according to Claim 2, wherein a shield electrode is disposed between upstream and downstream coils so as to be orthogonal to a coil axis direction.

4. A noise filter for removing noise flowing in a signal wire formed on a circuit board, wherein:

a pair of external electrodes that are connected to the signal wire are formed on an outside of an insulator, and on an inside of the insulator, a plurality of coils are connected in series which having both ends thereof electrically connected to the external electrodes respectively, and a capacitor is connected in parallel to at least one of the plurality of coils;

the coils are each formed by connecting a plurality of coil conductors, which are laminated through the insulator, in a spiral configuration through a via hole; and

the capacitor is formed by arranging one of the pair of external electrodes and a shield electrode so as to be opposed to each other

through the insulator, the shield electrode being located between upstream and downstream coils and electrically connected to both the upstream and downstream coils.

5. The noise filter according to any one of Claims 1, 3, and 4, wherein the shield electrode is set so as to have a surface area covering equal to or larger than $1/2$ of a surface area of a bore of at least one of the upstream and downstream coils.

6. The noise filter according to any one of Claims 1 to 4, wherein a plurality of LC parallel resonant circuits whose respective resonance frequencies differ from each other are formed by the coils and the capacitor individually connected in parallel to each of the coils.

7. The noise filter according to any one of Claims 1 to 4, wherein an LC parallel resonant circuit on a low frequency side is formed by the coil, the capacitor connected in parallel to the coil, and a floating capacitor generated due to formation of the coil, and an LC parallel resonant circuit on a high frequency side is formed by the coil and a floating capacitor generated due to formation of the coil.

8. A noise filter array comprising a plurality of the noise filters according to any one of Claims 1 to 4 that are integrated together while being arranged in an array individually in correspondence with a plurality of signal wires formed on a circuit board.

9. The noise filter array according to Claim 8, wherein connecting points between the coils provided to each of the signal wires are commonly connected together in an ungrounded state via a noise dispersing capacitor.